

ORE 642 Marine Environmental Remediation

Designation

Elective

Catalog Description

Thermodynamics, chemistry and measurements of marine pollutants, biodegradation and biotransformation of pollutants, symbiosis and mass transfer in biofilms, bioremediation of oil spills, hazardous sediments, algae control, regulations on marine environment. Pre: consent.

Prerequisites by Topics

Chemistry

Fluid mechanics

Textbook

None

Reference Books

1. *Practical Handbook of Marine Science*, Michael J. Kennish, CRC, 1989.
2. *Standard Methods for the Examination of Water and Wastewater*, L.S. Clesceri, A.E. Greenberg, A.D. Eaton, APHA, AWWA, WEF, 1998.
3. *Modeling Biochemical Processes in Aquatic Ecosystems*, Raymond P. Canale, Ann Arbor Science, 1976.
4. *Aquatic Chemical Kinetics*, Werner Stumm, Wiley-Interscience, 1990.

Course Objectives

To provide students the tools to evaluate the environmental effects of engineering projects in the marine environment.

Topics Covered

1. Seawater chemistry
2. Marine biological systems
3. Toxic and stimulatory responses
4. Transport and mixing
5. Environmental consequences and remediation of: marine mining, oil/gas extraction, coastal engineering projects, dredging, wastewater discharges, waste heat, non-point discharges, aquaculture.
6. Global warming
7. Future developments

Assessment

3 exams (60 %)

Engineering report (40%)

Usage of Engineering Tools and Computers

Computer use required for engineering report for data evaluation and word processing.

Schedule

Two 1.25-hour sessions per week

Contribution to Professional Component

Engineering Science: 2 credits

Engineering Design: 1 credit

Relationship to Program Outcomes

Program Outcome 2: Basic science, math, & engineering

Program Outcome 6: Problem formulation & solution

Program Outcome 9: Professional issues

Prepared by

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